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Today, I'd like to talk a little bit about NASA . . . who we are and what we're about.

And, I'd like to talk about how we, NASA and all of you in the commodity business, can work together to produce better crops and a better quality of life.

But first, I'd like to talk about David Letterman.

You'll understand why in a minute.

A couple of weeks ago, David Letterman began his monologue by mentioning the unseasonably warm weather for October in New York City.

He said earlier that afternoon it was hot . . . really hot . . . maybe 150-200 degrees.

Letterman paused . . .and deadpanned:

"It must be that damn El Nino."

If you're like me and you can't deliver a line like David Letterman, the joke is not that funny. Nor, by the way, is it very accurate.

But I'll share another example of what I'm trying to get at.

Recently on National Public Radio -- there was a parody of the movie "Independence Day."

Our fearless President -- a former fighter pilot -- is going to save our country and the world . . . not from aliens from another planet . . . but from the seemingly unbeatable . . .

El Nino.

From Morning Edition to "The Late Show". . . you can't pick up a newspaper or turn on the TV without seeing or hearing about El Nino.

CNN, the "All News Network" has become the "All Nino Network."

It's everywhere. Forgive the pun . . . but it's the hottest thing out there.

Why are there floods in one area and droughts in

another?

El Nino.

Why did the chicken cross the road?

El Nino.

How did the Cleveland Indians make it to the World Series?

You guessed it . . . El Nino.

Of course, El Nino's not responsible for everything.

Not everyone sitting in their homes watching the evening news could even possibly know what El Nino is -- this phenomenon that was first observed off the coast of Peru over 300 years ago when fisherman noticed that the water got a little warmer and the anchovy population declined.

And even today, our best scientists don't yet know why every few years, trade winds in the Pacific weaken -- or relax -- and cause a shift in the ocean currents. If you work in the "Pit" of the Chicago Board of Trade . . . or if you're a farmer . . . you might not even need to know exactly why this happens.

But everyone knows it happens. Everyone knows that this connection between atmosphere and ocean sets off a series of phenomena with global, regional and local implications.

And that's the point. We all don't know what El Nino is, but we all know that El Nino is.

And that's an incredible -- profit-earning, crop-improving, perhaps even lifesaving -- discovery.

Because without a doubt . . . whatever comes from this El Nino . . . it won't be as bad as it would be if we didn't know it was coming.

But we do know it's coming. Because of NASA.

We put up a series of three spacecraft.

The first measured ocean temperatures. NOAA -- the National Oceanic and Atmospheric Association -- has been monitoring those for some time.

A few years ago, we launched the second satellite.

Working in partnership with the French, NASA has developed a satellite called Topex Poseidon.

It is providing the most precise measurements ever of ocean surface height. This new technology actually measures

the ocean surface to within about one inch . . . an amazing breakthrough.

The third spacecraft is what we call the Scatterometer. We launched this just last year on a Japanese satellite. The Scatterometer is a microwave device that measures the wind velocity and the wind direction on the surface of the ocean for the first time.

Correlating the measurements from these three spacecraft . . . a bunch of nerdy scientists somewhere off in a corner . . . were able to predict -- for the very first time -- an El Nino condition. In fact, they witnessed the formation of what could be the strongest El Nino yet.

When we talk about weather, in 1997, we're limited to 5-day forecasts. Initially, forecasting was limited to about a day. With the invention of the telegraph, it went up to two days. Finally, with spacecraft and better data we were able to get that up to five days. And still, sometimes they're not that accurate.

But now, we're on the verge of a major breakthrough of monumental proportions -- predicting the weather on a seasonal to inter-annual basis.

We're going to put up the most aggressive constellation of spacecraft in the history of this planet. They are going to give a literal physical to the Earth over a multi-decadal period.

Because it is our objective -- hopefully within 25 years -- to make multi-decade predictions of climate, environment, atmosphere and oceans and land so we can better manage our resources for sustainable development . . . globally, regionally, and locally.

We are adding new measurements every year. And this data is going to be available, in real-time, over the Internet to anyone who wants it . . . as raw results and as peer-reviewed results. I'll talk more about that later.

But just imagine what this could mean . . . especially for all of you who are in the business of growing, processing, and marketing crops.

It is estimated that the 1993 El Nino event was responsible for anywhere between 8 and 12 billion dollars in damages. It affected 39 crops in 33 countries.

The weather disasters of that year reduced farm income an estimated $5.2 billion in counties declared disaster areas. The counties included 61 percent of all U.S. farms specializing in cash grains.

The flooding from the 1982-83 El Nino caused $1.27

billion dollars in damages to the U.S. Gulf States.

That El Nino caused wheat prices to go up 18 percent. Corn rose 78 percent. Soybeans 91 percent.

And the current El Nino? Well, we don't know for sure what the effects will be, but heating oil and natural gas prices could be hurt if El Nino brings the expected dose of warmer weather to the upper Midwest this winter.

The expected drier weather in areas like Southeast Asia and the West African Coast could impact cocoa and coffee growers.

And remember those anchovies off the coast of Peru? A lot of farmers use those anchovies as fish meal for cattle. They might buy soybeans instead. Soybean prices go up. So does wheat. So does cattle and meat prices in the supermarket.

In other words, the two main risks that need to be mitigated for you to do your jobs are the weather and markets. And NASA technology can help with both on a global level, a regional level and a local level.

El Nino is but one example. We are beginning to detect a similar El Nino-like pattern that originates in the Atlantic Ocean.

And still, there are others weather and climate occurrences and natural disasters. . . and we are not really sure whether they are due to natural variability or human induced activity.

But we do know, that if we can predict, we can prepare. Maybe even prevent.

That means better yields . . . and a better quality of life.

That's the goal. That's the mission. And we're not just talking about what we would call dramatic or extreme climate and weather events, like the floods or droughts of an El Nino. This isn't just about touchy-feely, tree-hugging stuff. This affects everyone. More efficient processes and better yields will be absolutely critical as the population continues to increase.

We want to be ready.

Like I said earlier, we are developing new technologies all the time -- planting the seeds, if you will . . . for the remote sensing and "precision" agriculture revolution.

These technologies -- Global Positioning System (GPS) satellites, state-of-the-art aircraft and cutting-edge spacecraft -- will allow us to monitor stresses on crops and soil and forests that the naked eye could never see.

We have both active and passive sensors. A passive sensor is sort of like an eyeball -- reflected light come off the surface. And an active sensor is more like a radar. It sends out a pulse . . .you wait until it hits and you get to reflect the signal from that pulse.

Allow me to share a little bit more about the passive measurements. A color TV, for the most part, has three colors. The naked eye is somewhat limited to color spectrum.

But if you go to much longer wave lengths -- or InfraRed wave lengths . . . beyond what the eye can see -- we can get images and measurements in multiple colors.

And from those images . . . from the stresses the multiple color images can now detect . . . we can begin to measure the moisture of the soil to know exactly how much irrigation water to add, or if we are adding too much.

We can begin to measure the condition of the crop to know exactly how much fertilizer to apply, or if we're adding too much.

We can begin to measure more precisely when to plant and harvest. Are we doing it too late, or too early.

And we can see if there's a pest lurking underground that could potentially destroy a crop . . . and in some cases we can even identify exactly what that pest is.

For instance, in California we're working with the multiple-billion dollar wine industry and using these kinds of images and technology to detect phylloxera . . . a pest that eats away at the roots of the vines.

We call it Grapevine Remote Sensing Analysis of Phylloxera . . . or GRAPES.

We're having great success . . . because you can only detect this pest from the air and from space.

This kind of real, concrete knowledge and data is crucial to agri-business.

And we can take all of this data one step further. Fields are variable. They change.

In the same field, for example, one are can be more porous than another. One part might be more conducive to another crop than another. One area might need less fertilizer than another.

Global Positioning Satellites help us determine this.

The series of satellites can also send a signal down to the farmer -- or even a robotic tractor itself -- for

real-time tilling . . . leading not only to more efficient use of water, fertilizer and pesticides . . . but more productive agriculture.

It's a very exciting time. And this is really an unbelievable process.

And this process is really what NASA is about. Providing the tools to explore new worlds and enhance life here on Earth. We're about a quest for knowledge. We're about better yields and a better quality of life.

In other words -- and as we call NASA's study of how the Earth's land, air, oceans and life interact to shape our ever-changing world -- NASA's not just about exploring other planets . . . it's about a Mission to Planet Earth.

One final thought before I open the floor for questions.

When all is said and done, it is the farmer or the rancher or the commodity analyst who makes the day-to-day management decisions. But clearly, and especially in a global economy, you need the information to make these decisions wisely.

Knowledge is power. Information is power. But only if you can get your hands on it. Only if you have access.

At NASA, we don't want to put 1.5 billion dollars per-year into the cutting-edge technologies that lead to better yields and a better quality of life . . . and then keep that knowledge from the people who need it most.

Our country can't afford to keep this data from our farmers and traders only to have it show up in Tokyo and Toulouse. That's not what we're about.

So today, I have a proposal. And hopefully we can talk more about this in the Q&A session.

I mentioned earlier that all of our data is available on the Internet. And it is. We also help produce what we call the Green Report. It puts the images and information we get from NASA satellites into the hands of traders in Chicago.

But still, I think we could do more.

So, I propose that at NASA, we have a senior official delegated to the commodity community.

They will work with you. To answer your questions. To help disseminate the information we put on the Internet. To be your single point of contact.

As the remote sensing industry matures -- it is predicted that this may become a 10-15 billion dollar-per-year industry -- you can go directly to this person to make

sure you get the data and the information you need.

But be prepared . . . this NASA official will also come to you and seek your advice and your expertise.

We want to make sure that the 1.5 billion dollars-per-year that NASA puts into Mission to Planet Earth is going to the right place.

We want to make sure that we're doing the right thing.

We want to make sure that this incredible wealth of knowledge translates not just to pop culture like NPR and David Letterman's show . . . but that it translates to what truly matters to every American . . . better yields and a better quality of life.

We have the know-how. We have the will. And we should settle for nothing less.

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